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Travelling in the Slow Lane of the Information Highway

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A study was undertaken of the effectiveness of incorporating e-mail contact and access to the world wide web within a graduate subject. Students were surveyed at the commencement of the subject to determine their access to and perceived competence in using computers, and at the end of the subject to elicit their views of the effectiveness of the subject materials. Strategies identified to improve student access and use of electronic media, included: very basic, hands-on tutorials; availability of and access to computers; incorporating use of electronic media into assessments; and availability of technical support. Advantages of using electronic media cited by students included: useful for contacting teaching staff and other students; and useful for accessing information. On-going problems cited by students, included: a new form of time wasting; (un)reliability of website information; difficulties accessing appropriate and relevant information; and poor availability of on-campus computers. This study demonstrated that the effectiveness and efficiency of IT in the educational environment is directly related to the educational relevance of IT services, and ease of access by students to computers. Additionally, there exists several student groups who have neither expertise nor confidence in using computers and limited access to them, making the mandatory use of such facilities in a teaching program problematic.

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Abstract

A study was undertaken of the effectiveness of incorporating e-mail contact and access to the world wide web within a graduate subject. Students were surveyed at the commencement of the subject to determine their access to and perceived competence in using computers, and at the end of the subject to elicit their views of the effectiveness of the subject materials. Strategies identified to improve student access and use of electronic media, included: very basic, hands-on tutorials; availability of and access to computers; incorporating use of electronic media into assessments; and availability of technical support. Advantages of using electronic media cited by students included: useful for contacting teaching staff and other students; and useful for accessing information. On-going problems cited by students, included: a new form of time wasting; (un)reliability of website information; difficulties accessing appropriate and relevant information; and poor availability of on-campus computers. This study demonstrated that the effectiveness and efficiency of IT in the educational environment is directly related to the educational relevance of IT services, and ease of access by students to computers. Additionally, there exist several student groups who have neither expertise nor confidence in using computers and limited access to them, making the mandatory use of such facilities in a teaching program problematic.

Introduction

Computers and various electronic media provide expanded learning and teaching opportunities. However, as with other media used to assist the education process, there is a need to monitor and assess students' capacities to access the media and to evaluate their skills and the perceived relevance of these media to the education process. Low levels of literacy and limited access to books will seriously influence a person's ability to learn. Similarly with computers and electronic services such as e-mail and the world wide web, poor access and low skill levels will limit their usefulness as teaching and educational tools. This is especially the case with certain student subgroups such as post-graduate students who have had less exposure to these media during their previous education programs, overseas students who have not used computers at all and students from households with limited domestic use of these resources. Much more needs to be known about the use of information technology if it is to become an aid to lifelong learning and not limited to being a tool for specific teaching opportunities.

In the redevelopment of a graduate subject, a variety of media were incorporated with the aim of increasing the educational opportunities for students. The use and relevance of these media as part of the education process in the subject were assessed, using pre- post surveying of the students. Evaluation at the completion of the first full teaching of the subject identified areas of improvement in the subject and changes were implemented. The use of the media was again evaluated at the end of the second year of teaching the subject. On the basis of these evaluations several strategies were identified to improve student access and use of electronic media and thus contribute to the effective and efficient use of information technology as part of mainstream tertiary education.

Subject Design

Several media were incorporated into the teaching of a graduate public health subject with a view to offering it via distance mode as well as on campus. The format of other graduate subjects available via distance developed within the public health program had included printed study guide materials accompanied by between 7 - 14 video episodes of 26 minutes, broadcast via SBS television. With the public health nutrition subject the provision of computer delivery and/or support

was considered important to incorporate, to complement the standard format of media and to encourage interaction between students regardless of whether they were on-campus or off-campus.

The study guide material had just been completed and a decision was made not to rewrite the material in web page format. Thus a web site was developed which provided basic course information and acted as a gateway to URL's of relevance to the subject material. Numerous sites, nationally and internationally, were identified which enriched the subject content and provided further information on topics. In this way students were provided with a starting point for searching the world wide web, but were also encouraged to seek additional sites relevant to their study interests or assignment topics.

With the enrolment of distance students into the subject it was felt important to provide them with an opportunity to interact with the on-campus students and teaching staff, as well as being able to submit assignments electronically if preferred. Individual e-mail accounts were established for all students and a listserv was initiated. Off-campus students were provided with a laptop computer and modem for the duration of the subject. On-campus students were expected to access university computer laboratories if they did not have their own computers. Off-campus students were given Eudora mail accounts while on-campus students were given accounts on the UNIX-based mail system. Teaching staff were on a Microsoft mail system.

Student Profile

Use of information technology should take into account the profile of the users. This was particularly the case with this graduate subject. The student group was mixed. Of the 33 and 34 students enrolled in the subject during the two years of the study period, there was a mixture of recent graduates, mature-age students, overseas students commencing study in Australia, a small number of men and a small number of distance students.

E-mail Access and Relevance

In the first week of classes the students were surveyed to determine their access to computers and their prior use of e-mail and the world wide web.

In the second year of offering the subject (1997) students were found to have greater access to computers and higher levels of prior use of e-mail and the world wide web than in the first year of offering the subject (1996). In 1997, 85% of students indicated that they had access to a computer (compared with 73% in 1996), of which 92% indicated that this access was via home-based computers (compared with 67% in 1996). Of those students with access to computers 48% were connected to a network in 1997, compared with 32% in 1996.

When asked to rate their skill as a computer user, more students in 1997 indicated that they had moderate skill levels (76% compared to 61% in 1996) and fewer students indicated that they considered themselves novice computer users (18% compared with 36% in 1996).

When asked to rate their skill as an e-mail user, most students in both years indicated that they were novice users. The pattern of use was similar to that of general computer use. More students in 1997 indicated that they had moderate skill levels in using the e-mail (8% compared to 3% in 1996) and fewer students indicating that they considered themselves novice e-mail users (59% compared with 91% in 1996).

Overall the pattern was one of moderate to low computer users with reasonable access to computers but limited access to networks. Greater computer access and higher levels of skill were reported by students in the second year of the subject.

During the early period of the first offering of the subject, numerous problems were experienced by students in utilising the e-mail. Many of these problems related to the different mail software programs used, which resulted in difficulties in sending messages and in receiving attachments. As

a result of these difficulties, an initial intention of using e-mail for collaborative work between students was put aside. The establishment, control and running of the majordomo discussion group also experienced problems and was under utilised by students in the first year of the subject. Feedback at the end of the first year indicated that many students (23%) had not used e-mail as they had found it difficult and frustrating due to the infrastructure problems and it did not directly link in with the requirements of the subject, that is, use of the e-mail did not link in with assessment requirements.

In the second year of the subject, students were introduced to the e-mail more gradually and were subscribed to the majordomo group by the course coordinator, so that they did not have to master that skill as part of their early experiences using the medium. In addition, students were required to submit a summary of their second assignment to the majordomo group. This served the purpose of information sharing between students on their independent assignment activities, as well as requiring all students to post a message. Use of the e-mail rose to 100% of students in 1997.

Many written comments were received from students in 1997 regarding their perceptions of the usefulness of e-mail. Overall the responses to the usefulness of e-mail were positive.

> "effective way to communicate"
>
> "I can see how useful it is"

However, several comments indicated that structural problems still presented barriers to greater student use of this medium.

> "if e-mail access was [via] uni computer labs, this was inconvenient and often involved long waiting times just to use computers"
>
> "too hard to access computers regularly"

Personal skill and confidence levels also influenced student use of e-mail.

> "only initial fear and apprehension stopped me from using it as a communication tool"
>
> "I had a lot of trouble sending mine [assignment summary] because I didn't know how"

World Wide Web Access and Relevance

The students' self-reporting of their skill at accessing the world wide web followed the same pattern of low skill level increasing in the second year of the subject. In 1996, 94% of students reported they had novice level of skill in accessing the world wide web, compared with 59% of students in 1997. Between 1996 and 1997 students reported an increase in moderate level of skill in accessing the world wide web from 6% to 41%.

In the first year of the subject students had received a single presentation on how to access the world wide web and the www site, which had been developed for the subject. However, by the end of the subject only 27% of students had accessed the www site for the subject and only 40% had accessed the world wide web generally. Comments received from the students at the end of the subjects indicated serious problems accessing computers on campus [*"the (computer lab in the) library is a zoo*"] and a perceived lack of relevance of using information available from the world wide web. The situation was somewhat different for the off-campus students who accessed the network via an external Internet Service Provider (ISP). Problems experienced in this arrangement included the deletion of student accounts without reason or warning and a business decision to close the ISP. This raised the question of whether in the future the university should install the appropriate infrastructure to provide Internet services to off-campus students (more reliable but costly), whether to use an ISP again but be aware that business decisions may result in closure of services, or to expect students to establish their own accounts with a service provider which is

local to them (a cost to the student in addition to subject fees - this may raise equity issues).

In the second year of the subject several changes had been introduced. Hands-on tutorials in accessing the world wide web were provided to the on-campus students in the first 4 weeks of classes, computer laboratories were booked for casual student use, the printed study guide referred to specific web sites as part of the expected reading for each topic and one of the two essay topics for the first assignment was based on the world wide web. These initiatives served to increase student access to the world wide web significantly. By the end of the subject 97% of students had accessed the www site for the subject and had used the www generally and 69% reported that they found the www moderately or very useful.

Barriers and Supports to IT Use

The benefits of information technologies should not be limited to the production of specific teaching aids. Long term benefit will accrue if the use of IT can be effectively incorporated into mainstream education processes. However, before this is possible, much more needs to be known about students' access to computers and IT, their skills in using these media and the perceived relevance of IT to the education process. Through the incorporation of e-mail and use of world wide web materials into a graduate subject, which also utilised other media in its educational approach, much was discovered about supports and barriers to IT use in the education process.

- All students, but particularly those who have not had access to computers previously, require basic, hands-on tutorials in the computer laboratories, not only to become familiar with computers generally and to allay fears related to using the technology, but to learn about how IT can be used to complement other education resources and information services relevant to the subject matter being taught. This type of activity should be considered to complement other computer-based training offered generally on campuses. Mature age students and students who have recently arrived from overseas countries may require additional basic support in using computers for educational purposes.
- The requirement for basic support of students in using computers may reflect a cohort effect. The students in the second year of teaching the subject entered with a higher computer skill level and greater access to computers than the students in the first year of the subject. This may indicate the rapidity with which the situation is changing and perhaps the declining need to provide such extensive student support in the future.
- Use of computers within the education environment requires access to computers. Just because computer laboratories are available on campus does not mean that students have access to them. Waiting in queues may be considered a waste of time; computer laboratories may be locked out of normal hours for security reasons but this may limit access by part-time students; access from home computers may be disrupted due to problems with the service provider or with the telephone services; part-time, on-campus students may only visit the campus to attend classes and thus need to be considered as "off-campus" students in relation to their computer needs; if software programs are difficult to use, this will limit the ability of students to access the medium (for example e-mail services via a mainframe UNIX system).
- To be educationally useful to students, the use of IT within a subject or program must directly relate to the stated outcomes of the subject, that is, the use of IT must be reflected in assessment requirements. Students quickly determine if the use of IT is a "nice to know" skill and therefore marginal to their primary purpose in taking the subject, or if the use of IT is essential to performing well in the subject. In the latter case, greater determination is demonstrated by students in overcoming the inevitable problems which arise in using electronic media. In the former case, problems in using the electronic media will result in lack of use.
- Use of IT as part of a range of educational strategies is useful for communication with other students and with staff and for accessing relevant and up-to-date information not available in the form of printed resources.
- On-going problems in using IT cited by students included: difficulties in accessing appropriate and relevant information; (un)reliability of website information; and a new form of time wasting.

This study demonstrated that there is a direct relevance of services such as e-mail and the world wide web to the general education environment of the tertiary sector. However, ease of access by students to computers must be assured before benefit can be gained in the education environment. Additionally, there exist several student groups who have neither expertise nor confidence in using computers and limited access to them, making the mandatory use of such facilities in a teaching program problematic.